REMARKS

Reconsideration of this application is respectfully requested. Claims 1-29 remain in the application.

Claims 1, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama et al. (U.S.P. 6,529,535), and in view of Nakanishi et al. (U.S.P. 6,374,021). Applicants respectfully traverse this rejection.

Claim 1 is an independent claim with claims 10 and 11 dependent thereon. Referring to claim 1, "a light source designed to produce a beam of light" and "a lens system positioned to receive the beam of light from the light source and transmit substantially all of the beam of light to a light terminal" are specified. Referring additionally to claim 11, it can be seen that the lens system is separate from the optical fiber, since the claim states "the light terminal includes an end of an optical fiber." Thus, it is clear from the claim language (and from applicants' specification and drawings) that the lens system is separate from the end of the optical fiber. This is important and provides what applicants' believe is a substantial advantage.

A substantial industry has blossomed in the present day in which fiber optics are used to transmit data between various remote points. To transmit the data, electrical signals must first be converted to light signals at one end of the fiber and then the light signals must be converted back to electrical signals at the other end. In many instances, the optical fibers are relatively fixed (similar to telephone or electric cables) and are engaged (plugged into) or disengaged from the conversion components for repairs, replacements, etc. It is most convenient, and in some applications essential, to be able to easily and quickly disengage apparatus from the optical fibers, an example of which can be seen in applicants' FIG. 1.

By providing a separate lens system any optical fiber can be engaged in the module without requiring a large amount of preparation. Thus, if an optical fiber breaks (after extended use) the end can simply be reinserted into the module. Further, since the a lens system is positioned to receive the beam of light from the light source and transmit substantially all of the beam of light to a light terminal, it is not necessary to perform any extensive and time consuming alignment procedures each time the optical fiber is disengaged and then re-engaged. If, for example, the end of the fiber were specially formed to perform some

function, realignment would be required each time the optical fiber is disengaged. Applicants believe their claimed device has solved that problem.

Further, as pointed out by applicants at the bottom of page 5 to the top of page 6 of their specification, one of the many types of optical fibers that might be used is the single mode fiber. It is well known by those skilled in the art that the glass core of single mode fibers is in the neighborhood of one micron in diameter. Applicants believe that forming the end of such a fiber into some intricate design would not only be difficult but probably impossible.

Thus, by providing a separate lens system that is aligned and fixed in the module or package, the optical fiber can be engaged and disengaged as often as required by simply inserting it into the receiving opening (see applicants' FIG. 1). Also, using this arrangement any of a variety of optical fibers (including single mode fibers) can be used.

It is also worth noting that applicants' novel structure will reflect a fixed amount of the main laser beam, rather than some amount of fringes of the beam. It will be understood by those skilled in the art that each

laser generally produces at least slightly different output patterns. Thus, from laser to laser there may be more or less fringe emissions. However, because applicants' claimed structure reflects a fixed portion of the main beam and focuses all of the remaining beam onto the end of the fiber, the light directed to the monitor diode will always be a fixed portion of the main beam and more of the main beam will be directed to the fiber.

Turning now to the disclosure and teaching of Katayama et al., it can be seen that the only optical element include in their light path is the lens tip of the fiber 2. Light from the laser is conducted only through the rounded tip 2a of the wedge shaped end. As can be seen in FIGS. 2A and 2B of Katayama et al., the rounded tip 2a is substantially less than one-half the total end area. Further, while the beam of light generated by most semiconductor lasers if slightly elliptical (rounded in some modifications) the light input at the end of fiber 2 in Katayama et al., is substantially an elongated rectangle extending along a diameter of the fiber. Clearly, the output of the laser is either very small in diameter or substantial portions of it are lost in reflections. This is especially interesting because a large amount of effort has been expended (by applicants and many others) in matching the laser to the fiber. In fact

applicants believe that their novel claimed structure solves any problems that might arise in the types of converters that incorporate specially formed fiber ends.

One additional feature of the structure of Katayama et al., is the fact that the end of the wedge must be aligned in a specific fashion relative to the monitor diode. For example, in one embodiment the wedge is aligned parallel to the base 6 ('535 spec., col. 7, line 61) and in another embodiment the wedge is aligned perpendicular to the base 6 ('535 spec., col. 9, lines 14-15). In either case, whenever fiber 2 is disengaged from the device it must be realigned with the laser and the monitor diode. As explained above relative to applicants' novel structure, it is believed that this realignment problem has been solved by applicants.

Thus, applicants believe that the structure claimed in claims 1, 10, and 11 is substantially different than anything disclosed by Katayama et al. Further, these differences provide applicants' structure with substantial advantages and, therefore, applicants believe that claims 1, 10, and 11 are patentable over anything disclosed or taught by Katayama et al.

Referring to Nakanishi et al., all of their embodiments disclose monitor diodes situated in the path of light emitted from the rear of the laser. Thus, Nakanishi et al. do not disclose a system in which a monitor diode receives a portion of the light emitted in the main or forward beam. Thus, while Nakanishi et al. may disclose a method to drive the light source and monitoring diode, they do not disclose structure similar to applicants' that could be combined with the structure of Katayama et al. to provide anything similar to applicants' claimed structure. Therefore, applicants believe that claims 1, 10, and 11 are patentable over any proper combination of Katayama et al. and Nakanishi et al.

Claims 2-9 and 12-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama et al. (U.S.P. 6,529,535), and in view of Nakanishi et al. (U.S.P. 6,374,021) and in further view of Togami et al. (U.S. Patent Application 2003/0053222). Applicants respectfully traverse this rejection.

Claims 2-9 are dependent on claim 1 and are allowable over any proper combination of Katayama et al. and Nakanishi et al. for the reasons explained above. Claims 12-29 all include structure similar to that claimed in claim 1 and are, therefore, allowable over any proper combination of

Katayama et al. and Nakanishi et al. for the reasons explained above.

Referring to Togami et al., no monitor diode associated with the laser is disclosed. Photodiode 304 is a receiver that receives signals from a remote source and provides no monitoring function for laser diode 302. Thus, Togami et al. do not disclose a system in which a monitor diode receives a portion of the light emitted in the main or forward beam.

While Togami et al. do disclose an optical assembly with multiple lenses, there is nothing in any of the applied references to suggest how those multiple lenses might be incorporated into the structure of Katayama et al. to direct light to a monitor diode. For example, assuming arguendo that the multiple lenses of Togami could be inserted between the laser and the fiber tip in the structure of Katayama et al., the light striking the tip would be focused and there would be no fringe light to reflect to the monitor diode. Conversely, if the light was not focused by the inserted multiple lenses there would be fringe light but the multiple lenses would be completely useless or unused.

Thus, adding the disclosure of Togami et al. to the disclosures of Katayama et al. and Nakanishi et al. does not add anything to the combination. Therefore, applicants believe that claims 2-9 and 12-29 are patentable over any proper combination of Katayama et al., Nakanishi et al., and Togami et al.

SUMMARY

Applicants' claimed structure has a large number of substantial advantages over anything suggested or taught by Katayama et al., Nakanishi et al., or Togami et al. individually or in any proper combination. Since none of the applied references disclose apparatus similar to applicants' claimed structure and since none of the applied references can achieve the functions of the present invention individually or in any proper combination, applicants believe that claims 1-29 are in condition for allowance.

Should there be any questions or remaining issues regarding the foregoing, Examiner is cordially invited to telephone the undersigned attorney for a speedy resolution.

Respectfully requested,

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01 April 2004
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